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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/558,645 04/26/00 KAPLAN

A 08935-170001

EXAMINER

IM52/1003

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ART UNIT

PAPER NUMBER

1725

DATE MAILED:

10/03/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/558,645

Applicant(s)

KAPLAN ET AL.

Examiner

Lynne R. Edmondson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-433 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☒ Claim(s) 42-43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "racetrack battery" is not clearly disclosed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1 and 7-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Terao et al. (USPN 5458993).

Terao teaches a cathode comprising a paste containing up to 90% MnO₂, 2% PTFE, a hydrophobic polymer and 8% carbon on a current collector (col 4 lines 15-30 and col 3 lines 38-40).

3. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kohlase et al. (DE 3242139 A1).

Kohlase teaches a cathode paste comprising 60% MnO₂, 8% carbon and 2-6% PTFE (abstract line 7).

4. Claims 15-17, 19-23, 26-29, 31 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Kordes et al. (USPN 3945847).

Kordes teaches a cylindrical battery comprising a container (34 having an air port, a cathode (28) coated on a collector (36), a zinc anode (31) and separators (32,33) (figure 4, col 4 lines 25-49 and col 9 lines 1-22). The cathode comprises up to 90% MnO₂ and 8% carbon with a binder material (col 5 lines 25-40) that may be 2.5-3.0 % polysulfone (col 11 lines 50-60) or 5% (col 18 lines 40-41). Polysulfone is a hydrophobic polymer. AA (col 13 line 65) and D (col 13 line 8) size cells are disclosed. The battery may also be rectangular with parallel elements forming a racetrack battery (figures 15 and 16). See also Kordes claims 1-5, 9 and 13-17.

5. Claim 39 is rejected under 35 U.S.C. 102(e) as being anticipated by Debe et al. (USPN 6183668 B1).

Debe teaches a method of making a cathode by combining a catalyst, carbon particles and a solvent to form a mixture and adding a hydrophobic polymer (col 1 lines

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40-65). Initial mixing takes place at 0 degrees (col 16 lines 43-55) followed by an additional mixing step at greater than 20 degrees (col 24 lines 62-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kohlase et al. (DE 3242139 A1) in view of Tomiyama (USPN 5677083).

Kohlase teaches a cathode paste comprising 60% MnO₂, 8% carbon and 2-6% PTFE (abstract line 7). Although use of the term "about" in the instant claim includes amounts close to 7, there is no disclosure of at least 7% binder (hydrophobic polymer).

Tomiyama teaches a cathode comprising MnO₂ (col 3 line 56), 1-50% carbon and 1-50% of a fluorinated polymer such as PTFE a known hydrophobic material (col 9 lines 13-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use about 7% binder to get similar properties of a material including about 6% binder. The use of the term "about" in the instant claim includes amounts close to 7.

7. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordesch et al. (USPN 3945874) in view of Tomiyama (USPN 5677083).

Kordesch teaches a cylindrical battery comprising a container (34 having an air port, a cathode (28) coated on a collector (36), a zinc anode (31) and separators (32,33) (figure 4, col 4 lines 25-49 and col 9 lines 1-22). The cathode comprises up to 90% MnO₂ and 8% carbon with a binder material (col 5 lines 25-40) that may be 2.5-3.0% polysulfone (col 11 lines 50-60) or 5% (col 18 lines 40-41). Polysulfone is a hydrophobic polymer. The battery may also be rectangular with parallel elements forming a racetrack battery (figures 15 and 16). However, there is no disclosure of binder content higher than 5%.

Tomiyama teaches a cathode comprising MnO₂ (col 3 line 56), 1-50% carbon and 1-50% of a fluorinated polymer such as PTFE a known hydrophobic material (col 9 lines 13-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ higher binder content when different binders are used (Kordesch, col 18 lines 14-20).

8. Claims 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordesch et al. (USPN 3945874) in view of Hull et al. (USPN 6265104 B1).

Kordesch teaches a cylindrical battery comprising a container (34 having an air port, a cathode (28) coated on a collector (36), a zinc anode (31) and separators (32,33) (figure 4, col 4 lines 25-49 and col 9 lines 1-22). The cathode comprises up to 90% MnO₂ and 8% carbon with a binder material (col 5 lines 25-40) that may be 2.5-3.0%

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polysulfone (col 11 lines 50-60) or 5% (col 18 lines 40-41). Polysulfone is a hydrophobic polymer. The battery may also be rectangular with parallel elements forming a racetrack battery (figures 15 and 16). Although AA (col 13 line 65) and D (col 13 line 8) size cells are disclosed, no other sizes are taught.

Hull teaches a battery comprising a sealed container (col 2 lines 27-35) for AAAA, AAA, AA, C or D sized cells (col 3 lines 11-15) wherein the anode comprises zinc (col 5 lines 15-27) and the cathode comprises MnO₂, carbon and a hydrophobic binder (PTFE) (col 3 lines 36-44).

It would have been obvious to one of ordinary skill in the art at the time of the invention to make AAA and C batteries in addition to AA (col 13 line 65) and D (col 13 line 8) in the same manner. Other battery sizes would be obvious variations.

9. Claims 32, 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kordesch et al. (USPN 3945874) in view of Mishina et al. (USPN 5800939).

Kordesch teaches a cylindrical battery comprising a container (34 having an air port, a cathode (28) coated on a collector (36), a zinc anode (31) and separators (32,33) (figure 4, col 4 lines 25-49 and col 9 lines 1-22). The cathode comprises up to 90% MnO₂ and 8% carbon with a binder material (col 5 lines 25-40) that may be 2.5-3.0 % polysulfone (col 11 lines 50-60) or 5% (col 18 lines 40-41). Polysulfone is a hydrophobic polymer. Although only AA (col 13 line 65) and D (col 13 line 8) are disclosed, other battery sizes would be obvious variations. The battery may also be rectangular with parallel elements forming a racetrack battery (figures 15 and 16).

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Although battery sealing is well known in the art, there is no disclosure of a sealing step. Neither is a prismatic battery disclosed.

Mishina teaches a sealed battery which has a prismatic or racetrack configuration (col 29 lines 44-55). The cathode is a mixture of MnO₂, carbon and a binder (col 29 lines 1-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to allow flexibility in the battery shape to make a variety of commercial batteries in an inexpensive manner (Kordesch, col 1 lines 8-15) and to seal the assembled commercial cells (col 13 line 8 and col 14 line 15) as is known in the art for improved performance, improved stability and more efficient electrochemical utilization (Kordesch, col 2 lines 1-12).

10. Claims 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debe et al. (USPN 6183668) in view of Buchta (USPN 4582553).

Debe teaches a method of making a cathode by combining a catalyst, carbon particles and a solvent to form a mixture and adding a hydrophobic polymer (col 1 lines 40-65). Initial mixing takes place at 0 degrees (col 16 lines 43-55) followed by an additional mixing step at greater than 20 degrees (col 24 lines 62-67). However, there is no disclosure of vacuum mixing.

Buchta teaches vacuum mixing of cathode materials which takes place at elevated temperatures (col 19 lines 3-9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ vacuum mixing at elevated temperatures to decrease paste viscosity and remove trapped air from the mixture (Debe, col 12 lines 58-67 and col 24 lines 62-67).

Allowable Subject Matter

11. Claims 42 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The closest prior art teaches the method of making the paste essentially as claim, however conventional processes employ much higher stirring rates (Fauteux et al. USPN 4935317).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kelsey et al. (USPN 6207322 B1), Shimizu et al. (USPN 5707763), Passaniti et al. (USPN 5308711), Chlilpoyil et al. (USPN 5401590), Anderson et al. (USPN 6280879 B1) and Yuasa (JPN 50-67431).

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne R. Edmondson whose telephone number is 703-306-5699. The examiner can normally be reached on M-F from 7-4 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 703-308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

LRE
September 24, 2001


TOM DUNN
SUPERVISORY PATENT EXAMINER
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